

PATENT COOPERATION TREATY

PCT**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**
(PCT Article 36 and Rule 70)

REC'D 09 MAR 2005



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Applicant's or agent's file reference 115735 Moss13/sko	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/NO 03/00414	International filing date (day/month/year) 10.12.2003	Priority date (day/month/year) 10.12.2002
International Patent Classification (IPC) or both national classification and IPC B63B27/24		
Applicant MOSS MARITIME AS et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 20.08.2004	Date of completion of this report 08.03.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Brumer, A Telephone No. +49 89 2399-2965 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/NO 03/00414

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-6 as originally filed

Claims, Numbers

1-12 received on 24.02.2005 with letter of 24.02.2005

Drawings, Sheets

1/7-7/7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
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International application No. **PCT/NO 03/00414**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-12
	No: Claims	
Inventive step (IS)	Yes: Claims	1-12
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-12
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/NO 03/00414

1. The closest prior art is disclosed in D1 (US-A-4315533) and shows the features of the first part of claim 1.

The problem to be solved is to provide a fluid transfer arm which is simple and economic to build and may be elongated to a certain extent without damage when connecting to vessels or a vessel to a platform for instance.

The solution is indicated by the features of the characterizing part of claim 1, especially by the provision of an spiral pipeline.

There is no fair suggestion in the available prior art documents as to the proposed solution.

2. The description is not harmonised with the claims and the problem and solution approach is not correctly applied.

The pertinent prior art according to D1 is not acknowledged in the introductory part of the description.

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CLAIMS

1. A system to transfer fluid via at least one pipeline from one structure to another structure (such as a platform (P) and a vessel (V) respectively), in which one of the structures has an offloading arm (5) which is movable in two planes perpendicular to each other and in which a part of the offloading arm remote from the one structure is engagable with the other structure, so to allow linear and rotational movements between the structures, at least a part of the pipeline along the offloading arm, remote from the one structure is attached to the offloading arm by means of at least one support moveable lengthwise relative to the offloading arm (5), and this part of the pipeline includes at least a first pipeline section (13) configured to compensate for movements between the two structures in the longitudinal direction of the offloading arm,
- characterised in that the first pipeline section (13) is configured as a spiral with the axis of the spiral extending generally parallel with the longitudinal direction of the offloading arm, and where the spiral pipeline is capable of sustaining a spiral shape under the combined weight of the pipeline and fluid within the pipeline.
2. A system according to claim 1, characterised in that the first pipeline section is configured with V-shaped rigid pipelines (13a) connected by swivel joints.
3. A system according to claim 2, characterised in that the V-shaped rigid pipelines connected by swivel joints are inverted and running in a generally vertical plane, generally parallel to the offloading arm.
4. A system according to any one of the preceding claims, characterised in that the part of the pipeline also includes at least a second rigid pipeline section connected to supports moveable lengthwise relative to the offloading arm.
5. A system as claimed in one of the preceding claims, characterised in that at least one of the supports is a wheel mounted trolley (15) arranged for movement lengthwise relative to the offloading arm (5).
6. A system as claimed in one of the preceding claims, characterised in that the part of the pipeline remote from the one structure and engagable with the other structure is itself connected to or part of another support (14) moveable lengthwise relative to the offloading arm.
7. A system as claimed in one of the preceding claims, characterised in that the pipeline is connected to the respective structures by joints (9) capable of accommodating angular and rotational movement between the pipeline and the respective structure.

8. A system as claimed in one of the preceding claims, characterised in that the pipeline is connected to one of the respective structures by a hinge joint (9) and to the other of the respective structures by a universal joint (18).
- 5 9. A system as claimed in any one of the preceding claims, characterised in that the pipeline has at least one joint (10) arranged to compensate for thermal expansion and contraction relative to the offloading arm and/or either or both of the structures, whereby to allow optimum alignment of adjacent lengths of pipeline.
- 10 10. A system as claimed in any one of the preceding claims, characterised in that there are a plurality of pipelines (13) extending between the structures.
11. A system as claimed in any one of the preceding claims, characterised in that a joint between the offloading arm and the other of the structures is formed as a pin (19) downwardly dependant from the offloading arm, and rotatable about a vertical axis in a receptacle (21) on the other of the structures.
- 15 12. A system as claimed in any one of the preceding claims, characterised in that tension (23) is applied between the other structure and the part of the offloading arm engagable with that other structure, so to resist separation of the loading arm (5) and the other structure.